T-093

# Dietary Intake of Methyl-Donors and Fetal Growth: A Longitudinal Study

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**Introduction:** The effect of maternal dietary intake of methyl-donors during pregnancy on human fetal growth is still unclear[1,2]. We aim to correlate intake of folate (B9), cobalamin (B12), and choline during gestation with fetal growth in urban Mexican women.

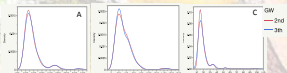
**Methods:** B9, B12, and choline intakes in diet were evaluated in pregnant women from Mexico City (PRINCESA cohort), using multi-step 24-hour dietary recalls obtained monthly during gestation. Trajectories of methyl-donors intake were calculated, as well as mean intakes during the second and third trimester, using pre-gestational body mass index (p-BMI) as covariable and correlated with ultrasound measurements of fetal growth (fetal weight = FW, fetal heart rate = FHR, and placental thickness = PT). The statistical difference (p<0.05) in data was determined by multiple regression, Wilcoxon test, 2-way ANOVA, and Spearman correlation.

**Results:** Four hundred eighty-nine pregnant women were included in the longitudinal study. A subset of 244 women having several dietary recalls during pregnancy was analyzed to compare intake by trimester. Both approaches evidenced that B9, B12, and choline intakes are similar during pregnancy. Interestingly, choline intake is correlated with p-BMI; obese women consume the least quantities in comparison to overweight, and this later group lower than normal-weight women. Negative correlations were found between B9, B12 and choline intakes with PT, as well as, choline intakes with FW. Methyl-donors intake and FHR showed no correlation between them.

**Conclusion:** Recommended dietary allowances (RDA) of B9 and B12 are covered in this group of women because, in addition to the dietary sources, they received supplements. On the other hand, choline intakes were under RDA during all pregnancy. We observed a less maternal intake of methyl-donors as the pregnancy progressed, affecting especially to women with p-BMI in the range of obesity. A decrease in the intake of methyl-donors during the phase of exponential growth of fetus may impact adversely some developmental programs linked to epigenetic modulation. Follow-up of these children is underway.

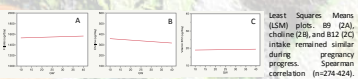
## Results

### 1. Methyl-donors intake at middle and late pregnancy



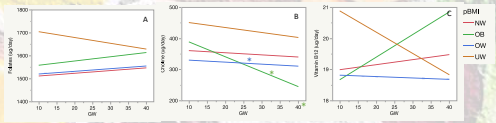

Comparative density plots. No differences between B9 (1A), choline (1B), and B12 (1C) with both trimesters were observed. 2-way ANOVA (n=274-424). GW: gestational week

### 2. Methyl-donors intake trajectories



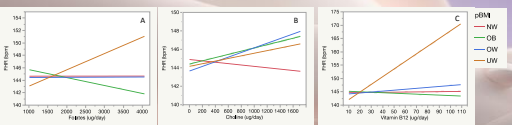

Least Squares Means (LSM) plots. B9 (2A), choline (2B), and B12 (2C) intake remained similar during pregnancy progress. Spearman correlation (n=274-424). GW: gestational week

### 3. Methyl-donors intake trajectories by pBMI and GW



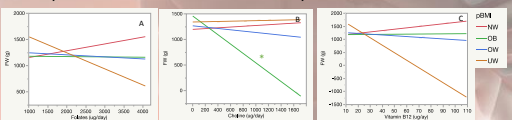

LSM plots. Differential choline (3B; OB: q=-2.71, p=.0.0069; OW: q=-2.81, p=0.005) intake were found by pBMI (F=4.95, p=0.002) among middle and late pregnancy. No differences were found between B9 (3A) and B12 (3C ) with pBMI. Statistical difference (*p<0.01) were obtained by Tukey HSD test. NW: normal weight; OB: obese; OW: overweight; UW: underweight

### 4. Methyl-donors intake and FHR correlation and interaction analysis



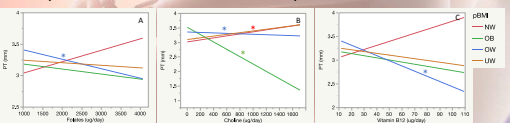

LSM plots (4A-C). No correlation and interactions were found between methyl-donors intake and FHR. Data was analyzed by ANOVA. NW: normal weight; OB: obese; OW: overweight; UW: underweight

### 5. Methyl-donors intake and FW correlation and interaction analysis




LSM plots (5A-C). No correlations between methyl-donors and FW were found. A negative interaction between choline intake (5B) and FW in OB women (F=2.51; *p<0.012) were found. Data was analyzed by ANOVA. NW: normal weight; OB: obese; OW: overweight; UW: underweight

### 6. Methyl-donors intake and PT correlation and interaction analysis




LSM plots (6A-C). A correlation between methyl-donors intake and PT were found (B9: F<3.577, p=0.0135; choline: F=4.2016, p<0.0057; B12: F<3.4808, p<0.0459). Interactions between methyl-donors intake and PT were found in OB and/or OW women (B9: OW F<2.19, *p=0.0288. Choline: NW F<2.61, *p= 0.0093; OB F=.3.80, *p<0.0002; OW F= 2.51, *p= 0.0123. B12: OW F<2.16, *p=0.03). Data was analyzed by ANOVA. NW: normal weight; OB: obese; OW: overweight; UW: underweight,

**References:** [1]McGee M *et al* 2018. *Nutr Rev* 76(6):469-478; [2]Zeisel SH, 2009. *Am J Clin Nutr*. 89(2):673S-75